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LEED Sustainable Sites and Indoor Environmental Quality Criteria in a LEED Gold-Certified Hospital: A Post-Occupancy Evaluation of Occupant Satisfaction

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Case Report

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Abstract

Healthcare facilities are among the most resource-intensive building types, where both environmental performance and occupant well-being are critical. Although LEED certification is widely used to assess sustainability, evidence of its relationship with occupant satisfaction remains limited, especially in healthcare settings. This study examines the association between LEED Sustainable Sites (SS) and Indoor Environmental Quality (IEQ) criteria and occupant perceptions at Başakşehir Çam and Sakura Hospital, a LEED Gold-certified complex in Istanbul, Türkiye. A post-occupancy evaluation (POE) was conducted using a structured questionnaire administered to 100 healthcare professionals. Perceptions of accessibility, transportation, green spaces, air quality, ventilation, odor control, thermal comfort, daylight, and acoustics were compared with the hospital's official LEED SS and IEQ outcomes. The findings reveal notable discrepancies between certification achievements and occupant perceptions. Respondents expressed concerns about accessibility, pedestrian infrastructure, electric vehicle charging stations, odor control, thermal comfort, and acoustic conditions. While several LEED-credited indicators were perceived less favorably, others showed stronger alignment between certification and user evaluations. This study contributes to the limited research on green building certification and post-occupancy performance in healthcare facilities. The results suggest that LEED certification, while valuable, does not fully capture occupant satisfaction. Integrating systematic post-occupancy feedback into certification and operational processes can promote more user-centered sustainable healthcare environments.

1. Introduction

Healthcare facilities occupy a uniquely demanding position within the built environment. Continuous operation, strict infection-control protocols, and dense medical-equipment infrastructure make hospitals among the most resource- and energy-intensive building types (Kim et al., 2023; Rahman et al., 2021). The sector is also a major contributor to national greenhouse gas emissions and waste generation, intensifying pressure on hospital design and operation to adopt verifiable sustainability standards (Eckelman & Sherman, 2016; Maden & Kerse, 2026).

Green building rating systems have become the primary tools for addressing this challenge. Systems such as BREEAM, Green Star, Green Mark, and CASBEE assign different weights to site, energy, water, materials, and indoor environmental quality criteria and were developed under distinct regulatory and climatic contexts, which limits direct comparability across systems (Erdede et al., 2014). Among them, Leadership in Energy and Environmental Design (LEED), introduced by the U.S. Green Building Council in 1998, has become the most widely adopted framework globally. LEED awards Certified, Silver, Gold, or Platinum certification based on credits earned across categories including Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality, and Innovation (Doan et al., 2017; Suzer, 2015). A healthcare-specific version was developed to address the sector's unique operational demands. By December 2024, nearly 3,950 healthcare projects had been certified or registered under this system worldwide (U.S. Green Building Council, 2025).

In Türkiye, LEED has been institutionalized through national regulation. Since 2012, the Ministry of Health has mandated LEED Gold or Platinum certification for all new hospitals with 200 or more beds, making Türkiye one of the few countries to require a specific international green building rating system (T.C. Sağlık Bakanlığı, 2025). Within LEED, the Sustainable Sites (SS) and Indoor Environmental Quality (IEQ) categories are particularly relevant to occupant experience. SS credits address site selection, density, alternative transportation, and outdoor amenities, while IEQ credits focus on ventilation, low-emitting materials, thermal comfort, acoustics, and daylighting (U.S. Green Building Council, 2024). Both categories are intended to shape the daily environment experienced by hospital staff and patients.

Despite the rapid adoption of LEED certification, a key question remains only partially answered: Does achieving LEED credits translate into built environments that occupants actually perceive as comfortable, healthy, and well-located? Studies of office buildings have shown that LEED-certified projects do not consistently outperform conventional buildings across key IEQ parameters such as thermal comfort, acoustics, and perceived air quality (Altomonte & Schiavon, 2013; Kent et al., 2024; Kern et al., 2016). Similar patterns have also been reported outside the LEED framework. For example, occupants of a Green Mark Platinum-rated building in Singapore reported sick-building-syndrome symptoms and sick-leave rates comparable to those in a non-certified building, despite higher design-stage scores (Tham et al., 2015). These findings suggest that green building scorecards often reflect design intentions more accurately than actual post-occupancy performance. Healthcare-specific evidence is more limited and mixed. While some occupant surveys report higher satisfaction in LEED-certified facilities (Kim et al., 2015; Xuan, 2018), patient-experience studies show only modest improvements over national averages. Golbazi and Aktas (2016, 2020) argue that hospitals may prioritize overall point accumulation over credits most relevant to occupant well-being. Few studies, however, have directly compared specific LEED credits with occupant perceptions in healthcare settings.

This gap is likely most pronounced in the SS and IEQ categories, which govern occupants' most immediate daily interactions with the building. Both are awarded primarily on design-stage documentation and specification compliance rather than in-use performance or occupant feedback (U.S. Green Building Council, 2024). Site-related credits rely on generalized urban-density and transit benchmarks that may not suit the operational realities of acute-care hospitals, where large parking and emergency logistics needs often result in peripheral locations (Angelov et al., 2024; Feijão et al., 2024). Similarly, IEQ credits emphasize ventilation strategies and material specifications but offer limited insight into performance under full operational loads (Frontczak & Wargocki, 2011). These challenges are especially relevant for large, recently certified hospital campuses.

The present study addresses this gap through a single-site, credit-matched investigation of Başakşehir Çam and Sakura City Hospital in Istanbul—one of the largest LEED Gold-certified healthcare campuses in Europe, with over 2,600 beds and approximately 1,000,000 m² of floor area. A structured questionnaire examining transportation access, outdoor amenities, ventilation, odor control, thermal comfort, acoustics, lighting, and material emissions was administered face-to-face to 100 healthcare workers. Survey responses were systematically compared with the hospital's official LEED scorecard at the

individual credit level for SS and IEQ. This approach identifies areas of agreement and mismatch between certification outcomes and occupant perceptions, providing actionable insights for designers, certifiers, and healthcare administrators.

2. Materials and Methods

This study employs a single-case, credit-matched comparative design to investigate the relationship between LEED-certified sustainability performance and occupant-reported satisfaction in a healthcare facility. The methodological framework combines two complementary sources of evidence: (i) documentary analysis of the hospital's official LEED BD + C: Healthcare scorecard and (ii) a structured questionnaire administered to hospital staff. The two datasets were subsequently cross-referenced at the level of individual LEED credits to assess the extent to which certified sustainability achievements correspond to occupants perceived environmental quality.

2.1. Case Site Selection and Description

Başakşehir Çam and Sakura City Hospital was selected as the case study site for three reasons: its recent commissioning, which minimizes confounding effects associated with aging building systems; its large scale, which provides exposure to a wide range of Sustainable Sites and Indoor Environmental Quality conditions; and its high patient throughput, which increases the number of staff with sustained daily interaction with the building environment. Developed under a public–private partnership by Rönesans Holding, the hospital occupies approximately 1,000,000 m² and has a bed capacity of 2,682. Located in Istanbul and served by both highway and metro connections, the facility is one of the largest healthcare campuses in Europe. The hospital achieved LEED Gold certification with a total score of 63 out of 110 points (Table 1) (Rönesans Holding, 2023). Figure 1 illustrates the geographical location (left) and aerial view (right) of Başakşehir Çam and Sakura City Hospital.

Table 1
Site and certification summary — Başakşehir Çam and Sakura City Hospital.

Attribute	Detail
Location	Başakşehir, Istanbul, Türkiye
Coordinates	41°06'21"N, 28°46'36"E
Total site area	1,000,000 m²
Certification level	LEED Gold (63/110 points)
Awards and recognitions	LEED Gold Certification; Merit Award; World's Largest Seismic Isolator Building; RFID Journal — Best Healthcare RFID/IoT Application; MIPIM Award — Best Healthcare Development, 2022

Source: Rönesans Holding (2023); USGBC LEED scorecard.

Table 2
LEED BD + C: Healthcare scorecard — Başakşehir Çam and Sakura City Hospital.

Evaluation Criteria	Points Earned	Maximum Points
Sustainable Sites	**10**	**18**
— Site selection	1	1
— Alternative transportation: proximity to public transit	3	3
— Alternative transportation: bicycle parking and shower/changing facilities	1	1
— Alternative transportation: low-emission vehicles	1	1
— Alternative transportation: parking capacity	1	1
— Site development: open space	1	1
— Heat island effect: hardscape	1	1
— Heat island effect: roof	1	1
Water Efficiency	**8**	**9**
Energy and Atmosphere	**26**	**39**
Materials and Resources	**7**	**16**
Indoor Environmental Quality	**5**	**18**
— IEQ performance during construction	1	1
— IEQ performance before occupancy	1	1
— Low-emitting materials	1	4
— System controllability: thermal comfort	1	1
— Thermal comfort: design and verification	1	1
Innovation	**4**	**6**
Regional Priority	**3**	**4**
Total	**63**	**110**

Source: official LEED scorecard, U.S. Green Building Council; category and credit labels translated from the original certification documentation.

2.2. Occupant Survey Instrument and Data Collection

A structured, interviewer-administered questionnaire was developed to evaluate staff perceptions of the Sustainable Sites (SS) and Indoor Environmental Quality (IEQ) conditions in the hospital. These two LEED

categories were selected because they encompass the aspects of building performance that occupants experience most directly and continuously, including access to the site, outdoor amenities, ventilation, thermal comfort, lighting, and acoustics. In contrast, the remaining categories (Water Efficiency, Energy and Atmosphere, Materials and Resources, Innovation, and Regional Priority) primarily concern technical systems, operational performance, and management practices that are less perceptible to building users (Tham et al., 2015).

The questionnaire consisted of two main sections. The first section focused on Sustainable Sites and included items addressing the hospital's location, transportation options, pedestrian and cycling infrastructure, parking facilities, electric vehicle charging stations, and outdoor green spaces. Participants were asked to evaluate how these features affected their daily commuting and overall well-being. The second section addressed Indoor Environmental Quality and covered ventilation performance, odor control, thermal comfort, lighting and daylighting, visual connection to the outdoors, and acoustic conditions, along with their perceived impact on comfort and work performance.

All items used a three-point Likert-type scale (Yes/Adequate, Undecided/Partially Adequate, No/Inadequate) and included an open-ended question at the end of each section for additional comments.

Participation was voluntary, and respondents were informed about the purpose of the study before completing the survey. Surveys were administered face-to-face on-site in February 2025. A convenience sample of 100 hospital employees participated, including physicians, nurses, auxiliary medical staff, administrative personnel, cleaning staff, and managers (Table 3). The sample comprised 57% male and 43% female respondents; 63% were under 40 years old, and 37% were between 41 and 60 years old. No respondents were over the age of 60.

Table 3
Respondent characteristics (n = 100).

Characteristic	Category	n (%)
Gender	Female	43 (43.0)
	Male	57 (57.0)
Age	Under 40	63 (63.0)
	41–60	37 (37.0)
	Over 60	0 (0.0)
Role	Physician	46 (46.0)
	Nurse	21 (21.0)
	Auxiliary medical staff	21 (21.0)
	Cleaning staff	6 (6.0)
	Sales / support staff	3 (3.0)
	Manager	2 (2.0)
	Administrative staff	1 (1.0)

2.3. Data Analysis

Survey responses were summarized as frequency distributions and percentages for each item in the two questionnaire sections. To address the study's research questions, each survey item was systematically mapped to the most closely corresponding LEED credit, prerequisite, or sub-credit according to the official LEED BD + C: Healthcare rating system documentation. The mapping process was conducted independently by two members of the research team, and any differences in classification were resolved through discussion until consensus was reached.

The paired items were then classified into three categories: (i) adequate under both LEED certification and occupant perception (Agreement); (ii) credited under LEED but perceived as inadequate by occupants (Mismatch – LEED positive, perception negative); and (iii) not credited under LEED but perceived as adequate by occupants (Mismatch – LEED negative, perception positive).

For items using the three-point response scale (Yes/Adequate, Partially Adequate, No/Inadequate), "Yes" and "Partially Adequate" responses were combined to indicate an overall positive perception. A combined positive response rate of more than 50% was interpreted as "adequate," while rates of 50% or below were classified as "inadequate." This threshold was selected to reflect a simple majority perception in a three-point scale.

Only descriptive statistical analyses (frequencies and percentages) were conducted, as the study employed a single-case design without a comparison group. Analyses were performed using NCSS 2020 Statistical Software (NCSS, LLC, Kaysville, UT, USA).

3. Results

3.1. Sustainable Sites Findings

Among the respondents, 54% were aware that the hospital held LEED certification, whereas 46% were unaware of its certification status. Regarding transportation- and site-related features, 80% rated public transit access as adequate, 89% rated the parking facilities as adequate, and 71% rated the hospital garden as adequate. In contrast, 71% considered the electric vehicle charging stations inadequate.

Perceptions of overall accessibility were less positive. Only 33% of participants rated the hospital as adequately accessible, while 23% reported it as partially adequate and 44% as inadequate. Similarly, the surrounding transportation infrastructure, including pedestrian pathways, bicycle routes, and green-space connections, was rated as inadequate by 62% of respondents (Table 4).

Table 4
Distribution of Responses to the Sustainable Sites Questions

Question	Response	n (%)
How do you usually commute to the hospital?	Private vehicle	46 (46.0)
	Shuttle service	49 (49.0)
	Public transportation	13 (13.0)
Are you satisfied with public transportation options to the hospital?	Yes, adequate	55 (55.0)
	Partially adequate	34 (34.0)
	No, inadequate	11 (11.0)
Do you consider the public transit stops (bus, metro, etc.) near the hospital to be adequate?	Yes, adequate	80 (80.0)
	No, inadequate	20 (20.0)
Is the number of covered/open parking areas sufficient?	Yes, adequate	89 (89.0)
	No, inadequate	11 (11.0)
Are the electric vehicle charging stations for staff adequate?	Yes, adequate	29 (29.0)
	No, inadequate	71 (71.0)
Are you generally satisfied with the accessibility of the hospital's location?	Yes, adequate	33 (33.0)
	Partially, some improvements needed	23 (23.0)
	No, inadequate	44 (44.0)
Is the supportive transportation infrastructure around the hospital (walking paths, bicycle paths, green spaces) adequate?	Yes, adequate	38 (38.0)
	No, inadequate	62 (62.0)

Question	Response	n (%)
Do you find the hospital garden area adequate?	Yes, adequate	71 (71.0)
	No, inadequate	29 (29.0)

When the survey findings were compared with the LEED certification outcomes, Agreement was observed for public transportation availability, proximity to transit stops, and the provision of covered and open parking facilities. In these cases, both LEED certification and occupant evaluations indicated adequate performance.

Mismatch was identified for electric vehicle charging stations, overall site accessibility, and supporting infrastructure, including pedestrian pathways, bicycle routes, and green-space connectivity. Although the corresponding LEED credits were achieved, occupants rated these aspects as inadequate.

One additional Mismatch was identified in the opposite direction. The hospital garden area received a limited LEED score, whereas 71% of respondents rated it as adequate. This finding indicates that positive user perceptions may occur even when the corresponding LEED credit is only partially achieved (Table 5).

Table 5
Comparison of Survey Results and LEED Scoring for Sustainable Sites Criteria

Criterion	Occupant Perception	LEED Credit Achievement	Agreement Status
Satisfaction with public transportation options	Adequate (89%)	Achieved	Agreement
Adequacy of public transit stops	Adequate (80%)	Achieved	Agreement
Number of covered/open parking areas	Adequate (89%)	Achieved	Agreement
EV Charging stations	Insufficient (71%)	Achieved	Mismatch
Overall accessibility of location	Insufficient (44%)	Achieved	Mismatch
Walking/bicycle path and green space infrastructure	Insufficient (62%)	Achieved	Mismatch
Hospital garden area	Adequate (71%)	Not achieved	Mismatch

Agreement = occupant perception and LEED credit achievement point in the same direction; Mismatch = occupant perception and LEED credit achievement point in opposite directions.

3.2. Indoor Environmental Quality Findings

Of the participants, 83% expressed satisfaction with indoor air quality, although 62% reported odor problems associated with paint, adhesives, or cleaning products. Perceptions of thermal comfort were less favorable, with only 44% reporting satisfaction and 56% indicating a need for improvement.

Satisfaction with lighting and daylight availability ranged from 82% to 92%. In addition, 73% of respondents indicated that visual connections to the outdoors had a positive influence on their work motivation. Acoustic conditions received more mixed evaluations, with 54% reporting difficulties in concentration or communication due to noise (Table 6).

Table 6
Distribution of Responses to the Indoor Environmental Quality Questions

Question	Response	n (%)
Are you generally satisfied with the air quality in your work area?	Yes, adequate	83 (83.0)
	Partially, some improvements needed	12 (12.0)
	No, inadequate	5 (5.0)
Do you experience a sense of insufficient ventilation, unpleasant odor, or stuffiness in your work environment?	Never	71 (71.0)
	Rarely	28 (28.0)
	Often	0 (0.0)
	Always	1 (1.0)
Are you exposed to tobacco smoke in or around the hospital?	Yes, rarely	56 (56.0)
	Yes, often	7 (7.0)
	Yes, every day	10 (10.0)
	No, never exposed	27 (27.0)
Do you think the designated smoking areas are located away from hospital entrances?	Yes	75 (75.0)
	No	25 (25.0)
Do you notice an unpleasant odor from paint, adhesives, furniture, or cleaning products in your work environment?	Yes, constantly	38 (38.0)
	Partially, rarely	24 (24.0)
	No, never noticed	38 (38.0)
Are you satisfied with the temperature level in your work area?	Yes, temperature is appropriate	44 (44.0)
	Partially, some improvements needed	22 (22.0)
	No, usually too hot or too cold	34 (34.0)

Question	Response	n (%)
Can you control the air conditioning or heating systems in your work area?	Yes	65 (65.0)
	No	35 (35.0)
How would you rate the lighting level in your work area?	Adequate and comfortable	82 (82.0)
	Too bright and uncomfortable	12 (12.0)
	Insufficient and dim	6 (6.0)
Can you sufficiently benefit from natural light in your work area?	Yes	92 (92.0)
	No	8 (8.0)
Does your work area have a window or natural light source?	Yes	87 (87.0)
	No	13 (13.0)
Is the daylight level in your work area adequate?	Yes, I receive adequate daylight	83 (83.0)
	Partially adequate	8 (8.0)
	No, inadequate	9 (9.0)
Can you see the outdoors from your work area?	Yes, I have a clear view	75 (75.0)
	Partially visible	12 (12.0)
	No, I work in a fully enclosed space	13 (13.0)
Does having a window or outdoor view affect your work motivation?	Yes, positively	73 (73.0)
	No, it makes no difference	12 (12.0)
	No, I have no view	15 (15.0)
How would you rate the noise level in your work area?	Quiet, I can work comfortably	50 (50.0)
	Moderately noisy but not disruptive	34 (34.0)

Question	Response	n (%)
	Noise level is high and distracting	16 (16.0)
Do you experience difficulty concentrating or communicating due to noise in your work environment?	Yes, often	34 (34.0)
	No	46 (46.0)
	Sometimes	20 (20.0)

Table 7 presents the comparison between occupant responses and LEED assessment outcomes for the Indoor Environmental Quality criteria.

Table 7
Comparison of Survey Results and LEED Scoring for Indoor Environmental Quality Criteria

Criterion	Occupant Perception	LEED Credit Achievement	Agreement Status
Overall air quality satisfaction	Adequate	Achieved	Agreement
Ventilation / odor / stuffiness perception	Adequate	Achieved	Agreement
Environmental tobacco smoke exposure	Insufficient	Not achieved	Agreement
Distance of smoking areas from entrances	Adequate	Achieved	Agreement
Low-emitting materials (paint/adhesive odor)	Mixed	Not achieved	Mismatch
Thermal comfort (temperature satisfaction)	Adequate	Achieved	Agreement
Occupant control of heating/cooling systems	Adequate	Achieved	Agreement
Indoor lighting level	Adequate	No corresponding credit achieved	Mismatch
Use of natural light	Adequate	No corresponding credit achieved	Mismatch
Presence of window/natural light source	Adequate	No corresponding credit achieved	Mismatch
Adequacy of daylight level	Adequate	No corresponding credit achieved	Mismatch
Outdoor view (visual connection)	Adequate	No corresponding credit achieved	Mismatch
Effect of view on work motivation	Adequate	No corresponding credit achieved	Mismatch
Acoustic performance (noise level)	Adequate	No corresponding credit achieved	Mismatch
Concentration/communication difficulty due to noise	Adequate	No corresponding credit achieved	Mismatch

Agreement = occupant perception and LEED credit achievement point in the same direction; Mismatch = occupant perception and LEED credit achievement point in opposite directions.

4. Discussion

The most notable finding of this study is the clear divergence between LEED certification outcomes and occupant perceptions in a LEED Gold-certified hospital. While the Sustainable Sites category achieved 10 out of 18 available points, occupants reported dissatisfaction with several key aspects, including site accessibility, pedestrian and cycling infrastructure, and electric vehicle (EV) charging facilities. Conversely, the Indoor Environmental Quality (IEQ) category achieved only 5 out of 18 points, yet occupants expressed generally favorable perceptions of air quality, ventilation, daylight availability, and visual connection to the outdoors.

This inverse pattern—high credit achievement paired with dissatisfaction, and low credit achievement paired with satisfaction—provides strong evidence that LEED scores and occupant experience measure fundamentally different aspects of building performance. LEED credits are primarily awarded based on design-stage technical compliance and documentation, whereas occupant satisfaction reflects real-world operational experience accumulated over time. A credit can therefore be technically earned without delivering meaningful experiential benefits, while a design feature may perform well for users even without corresponding LEED points. This distinction, rather than flaws in either system, largely explains the observed mismatches and aligns with previous post-occupancy studies (Altomonte & Schiavon, 2013; Kern et al., 2016; Altomonte et al., 2024).

Sustainable Sites: Infrastructure credits without operational adequacy

Agreement between LEED achievement and occupant perception was limited to public transportation access, transit connectivity, and parking provision. In other areas, significant divergence appeared. Credits for green vehicles and site accessibility were achieved, yet occupants reported insufficient EV charging stations, poor general accessibility, and inadequate pedestrian and cycling infrastructure. Interestingly, the hospital garden received positive evaluations despite lacking a specific LEED credit, indicating that occupants value certain environmental features not fully recognized by the current certification framework.

These findings highlight a key limitation of LEED's Sustainable Sites criteria when applied to large healthcare campuses. Meeting credit thresholds does not necessarily ensure that infrastructure can support the intense, continuous use by thousands of staff, patients, and visitors daily. This demand profile differs markedly from the office and institutional buildings for which many Sustainable Sites credits were originally developed. Evaluating healthcare facilities within their broader urban and transportation context, rather than against generic thresholds, appears necessary to bridge this gap (Angelov et al., 2024; Feijão et al., 2024).

Indoor Environmental Quality: Experiential value beyond simulation-based scoring

In the IEQ category, the reverse pattern emerged. The low-emitting materials credit was not achieved, consistent with occasional occupant reports of chemical odors—likely linked to intensive clinical cleaning and operations. In contrast, daylight adequacy (83–92% positive) and access to outdoor views (75–87% positive) were rated highly despite limited or absent corresponding LEED credits. These results

suggest that architectural features such as large windows, atriums, and sightlines to nature can deliver significant experiential value that simulation-based scoring may not fully capture, a finding supported by biophilic design research (Kellert & Calabrese, 2015).

Acoustic performance and thermal comfort remained mixed, with notable subsets of respondents reporting difficulty concentrating due to noise and thermal dissatisfaction. Such issues reinforce the need for continuous post-occupancy monitoring of factors like material off-gassing, acoustics, and thermal regulation, rather than relying solely on one-time certification assessments (Frontczak & Wargocki, 2011).

Awareness as a mediating factor

Only 54% of respondents were aware of the hospital's LEED certification. This limited awareness likely contributes to the observed mismatches: occupants naturally evaluate the building based on direct daily experience rather than formal certification criteria. This finding underscores that the success of green buildings depends not only on technical performance but also on effective communication of sustainability features to users (Cole, 2005; Worden et al., 2020).

Implications

Overall, this study demonstrates that sustainable healthcare facilities are best evaluated through a hybrid approach that combines LEED-style technical certification with systematic post-occupancy evaluation (POE). Certification captures design intent and compliance, while POE reveals how buildings actually perform in daily clinical use. Integrating both methods can identify critical gaps—as seen in Sustainable Sites and IEQ here—and guide targeted improvements such as expanding EV charging capacity, enhancing acoustic control and odor management, and better communicating sustainability achievements to occupants. Such an integrated framework will support the development of hospitals that are not only technically green but also genuinely supportive of occupant well-being.

5. Conclusions

This study examined the relationship between LEED-certified performance and occupant perceptions in a LEED Gold-certified hospital through a credit-matched post-occupancy evaluation of Sustainable Sites (SS) and Indoor Environmental Quality (IEQ) criteria at Başakşehir Çam and Sakura City Hospital. The findings showed that LEED certification outcomes and occupant perceptions do not always align. In the SS category, agreement was observed for public transportation access, parking availability, and the hospital garden. However, several LEED-credited features, including electric vehicle charging facilities, overall site accessibility, and pedestrian and cycling infrastructure, were perceived unfavorably by occupants. In contrast, occupants reported high satisfaction with daylight availability and visual connection to the outdoors despite limited IEQ credit achievement. These findings suggest that LEED certification outcomes and occupant experience represent different dimensions of building

performance. While LEED certification provides a valuable framework for evaluating sustainability strategies, certification achievements alone may not fully reflect post-occupancy user experience.

This study contributes to the growing body of research on green building performance by providing a credit-level comparison between certification outcomes and occupant perceptions. The findings highlight the importance of integrating systematic post-occupancy evaluation into the assessment of certified healthcare facilities. Future studies should extend this approach to multiple healthcare facilities across different certification levels and contexts using larger and more representative samples.

6. Limitations

The study's findings should be interpreted cautiously. Conducted in a single LEED Gold-certified hospital, the results have limited generalizability across different certification levels, climates, or healthcare contexts. The cross-sectional design captures perceptions at one point in time and cannot track changes related to awareness, operational adjustments, or seasonal variations. Data relied on self-reported measures without complementary objective environmental monitoring (e.g., illuminance levels, sound pressure, or air quality measurements). Finally, awareness was examined as a plausible explanatory factor rather than a statistically tested mediator.

Declarations

Ethics Declaration

This study was approved by the Social and Human Sciences Ethics Committee of Istanbul Aydın University (Decision No. 2025/04, dated 17 April 2025). The research was conducted in accordance with the ethical standards of the institutional research committee. Participation in the questionnaire survey was voluntary. Written informed consent was obtained from all participants prior to data collection, and all responses were collected anonymously and treated confidentially.

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Author Contribution

Author Contributions: G.F.Y.C. supervised the research, contributed to the study design, and critically reviewed the manuscript. K.K. contributed to the study design, data collection, data analysis, and preparation of the manuscript. S.B.E. contributed to the study design, data interpretation, and revision. All authors read and approved the final manuscript.

Website: usgbc.org/projects/basaksehir-ikitelli-city-hospital?view=scorecard

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Figures



Figure 1

Location and aerial view of Başakşehir Çam and Sakura City Hospital. Google Earth 2026